Space Weather Forecast

Issued on Thursday, 27 April 2023 at 01:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: G1-G2/Minor-Moderate Storm risk Day 1 (27 Apr) but reducing. Slight chance of M-class flares (R1-R2 Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with only a small number of minor Common-class flares observed. There are currently seven sunspot regions on the visible disc. Two regions close together in the southeast quadrant are currently the two largest regions on the disc, both continue to show minor development and reasonable complexity. A new region rotating onto the northeastern limb may prove to be a complex region, but is too near the limb for a complete view or a proper classification. All other remaining sunspot regions are small at present.

An eruption from the southwest quadrant beginning around 25/1900 UTC has led to a Coronal Mass Ejection (CME) which is mostly directed south and west of Earth. There is a very low chance of a glancing blow during 28 April. A further eruption around 26/0545 UTC, also from the southwest, appears directed slightly further away from Earth although a very slight glancing blow remains possible, most likely during the 29 April.

Solar Wind / Geomagnetic Activity: The solar wind has shown persistent elevated wind speeds during much of the period around 500-550km/s, with a slow increase from around 26/1800 UTC up to strong levels of 600-650km/s. The total magnetic field was weak, with an increase recorded at approximately 26/1730 UTC to moderate levels, slowly declining by the end of the period. The important north-south component has been mostly weakly southward directed but highly variable, with moderate peak values recorded shortly after the increase in total magnetic field. Geomagnetic activity has been Quiet to Active (Kp 1-4).

Energetic Particles / Solar Radiation: Solar radiation has been at background levels throughout.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low, with just a slight chance of reaching Moderate levels.

Solar Wind / Geomagnetic Activity: An eruption on 24 April produced a CME which may give a glancing blow at Earth in the first half of Day 1 (27 Apr). Further eruptions on 25-26 April gave other CMEs which are considered most likely to miss, but there is a very low risk of a glancing blows during Days 2 and 3 (28 and 29 Apr).

Solar wind speeds currently at elevated levels with the likely arrival of a fast wind associated with an equatorial coronal hole. The potential arrival of the CME from 24 April could combine

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

with this to increase the geomagnetic response. The fast wind is expected to continue at affect Earth into Days 2 and 3 (28 and 29 Apr), perhaps with some weakening of the winds during Day 4.

Geomagnetic activity is expected to be at Quiet to Unsettled levels through much of Day 1, increasing to Unsettled or Active with a slight chance of G1/Minor Storms (Kp5) as the fast wind arrives, then a possible further increase with the first CME giving a slight chance of a G2/Moderate Storm (Kp 6). Activity is then likely to wane through Days 3 and 4, although the risk of a further CME glancing blow on Day 3 could prolong a slight chance of G1 intervals.

Energetic Particles / Solar Radiation: Solar radiation is currently at background levels and is most likely to remain there during the period.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	20	10	5
Strong	G3	No	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	15	15	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	2	3	4
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.